



# Northwest Territories

Report on Household Internet Affordability  
in Rural/Remote Communities

Sept. 22, 2022



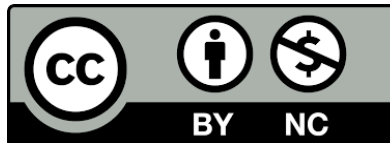
DigitalNWT



## About DigitalNWT

DigitalNWT is a project hosted on MakeWay's Shared Platform. It was funded by Innovation, Science and Economic Development Canada's Digital Literacy Exchange Program (2019-2022).

This DigitalNWT research report is made available under a [Creative Commons Attribution-NonCommercial 4.0 International License \(CC-BY-NC 4.0\)](https://creativecommons.org/licenses/by-nc/4.0/).



DigitalNWT is led by the project Steering Committee: the Tłıchǫ Government, the Sahtú Renewable Resources Board (SRRB), Inuvialuit Regional Corporation (IRC), and the Gwich'in Tribal Council (GTC). These organizations are partnered with the University of Alberta, the Smart Communities Society NWT/Computers for Schools NWT, Hands On Media Education, and Aurora College to ensure the successful delivery of the program.

Please cite this report as: DigitalNWT/McMahon & Akçayır. (2022). *DigitalNWT Northwest Territories Report on Household Internet Affordability in Rural/Remote Communities*.

More information on DigitalNWT is available at: <https://www.digitalnwt.ca/>

DigitalNWT Research contact: Rob McMahon : [rob.mcmahon@ualberta.ca](mailto:rob.mcmahon@ualberta.ca)



## **DigitalNWT research finds Internet affordability is a barrier for NWT households — particularly for low-income households in the smaller, most geographically remote communities**

By Rob McMahon and Murat Akçayır

There are persistent and ongoing inequities between communities in Northern and southern Canada regarding the quality, affordability and availability of broadband services, as well as between larger and smaller population centres in the North (Hambly & Rajabiun, 2021; McMahon & Akçayır, 2022a, 2020b). While urban/southern areas benefit from more reliable, affordable, and faster broadband services, a majority of rural/remote Northern communities continue to experience lower availability of and accessibility to affordable, high-speed broadband services.

In this report, we present original, primary data collected from rural/remote communities in the Northwest Territories (NWT) that illustrates these divides. In the 11 communities (and 450 households) that we surveyed in 2020/21 and 2021/22, we find the majority of respondents who gave a reason why they do not subscribe to household Internet services stated it was because of price. As well, there are wide income disparities in the NWT, as reflected in the diversity of communities and of households inside these communities. Here we focus on the affordability challenges experienced by low-income households in the most geographically remote communities. Given limited in-person services, households in these communities are most dependent on telecommunications to access essential health care and education services, and to participate in economic activities – particularly during the Covid-19 pandemic when travel inside the territories and between the NWT and Southern Canada was restricted. Yet these communities also pay the highest prices for Internet services when data overage fees and requirements to purchase telephone lines are taken into account. Our research found that low-income households in some of the most remote communities in Canada must dedicate at least 6.13% of their monthly income to Internet services.

A range of policy initiatives has been implemented to address these issues, yet many Northern communities remain well behind those in southern/urban areas. For example, in 2016 the Canadian Radio-television and Telecommunications Commission (CRTC) set a basic service objective to deliver broadband services of at least 50 Mbps download and 10 Mbps upload (50/10) speeds with unlimited data transfer capability to 90% of Canadian homes and businesses by the end of 2021 (100% by 2031) (CRTC, 2022b). This initiative has been supported by the CRTC's Broadband Fund, a five-year, \$750 million broadband initiative (CRTC, 2021) as well as the Universal Broadband Fund (UBF) administered by Innovation, Science and Economic Development Canada (ISED, 2021). However, evidence from the CRTC's most recent annual Communications Market Report (formerly the Communications Monitoring Report) indicates that only 44.1% of households in the North and 39.1% of First Nations reserves have services available that meet the Commission's 50/10 objective (CRTC, 2022a).



Disparities in broadband connectivity are not exclusive to Canada; this situation is common in many countries around the world, including the UK, the USA, and many European countries (OECD, 2021), where there are significant regional gaps in the quality of telecommunication services. However, in Canada these challenges have persisted for years (Hudson, 2011). During the global pandemic, these gaps became more evident and brought new challenges (e.g., limited ability to access state-of-the-art online education, remote work, and business operations) for individuals living in remote/rural areas, including Northern Canada. These disparities have attracted further attention and remain a serious concern (Council of Canadian Academies, 2021; Hudson, 2017; Weeden & Kelly, 2021).

While the severity of differences between Northern and southern Canada is clear, there are very limited public data available regarding the specific digital challenges experienced by people living in the far North — and particularly regarding smaller population, geographically rural/remote communities. While Northern rural/remote communities — many of which are primarily populated by diverse Indigenous peoples — are those most affected by these digital inequities, they are also the least researched areas regarding these issues. The Government of the NWT conducts household surveys in all NWT communities regarding the numbers of Internet subscriptions (2019). However, these do not include information about why people do or do not subscribe to household Internet, or about the prices that they pay. While incumbent telecommunications companies such as Northwestel may have information about these issues, it is not made publicly available. Therefore, our research presents unique data on these important issues that are not otherwise accessible.

## Survey Details

This report presents the results of household (HH) surveys from 11 small-population, rural/remote communities outside of NWT centres such as Yellowknife, Inuvik, Fort Smith and Hay River.<sup>1</sup> Our primary focus is on smaller/remote NWT communities, since they are among the most affected by digital divides (e.g., lack of competition, slow speed, and face more challenges associated with road access -- many of which are only accessible only via air flights or seasonal ice-roads on frozen lakes and rivers) (Hudson, 2011; O'Donnell & Beaton, 2018; McMahon, Akçayir, McNally, & Okheena, 2021). Methodological details about our study are available in "Appendix A: Study Methodologies". The participating communities were chosen in collaboration with our research partners, the Indigenous NWT-based organizations listed in Appendix A). As demonstrated in Table 1, while overall numbers of respondents may appear to be low, given the small population of these communities, the surveys are quite representative. For example, depending on the year (2020/21 or 2021/22), we surveyed one quarter (25%) or more of households in Délı̄nę, Fort McPherson, Sachs Harbour, Tsiigehtchic, Tulita, Ulukhaktok, Wekweètì, and Whatì.

---

<sup>1</sup> Three communities that we surveyed are not included in our analysis due to low numbers of responses relative to total HHs: 16 (of 460 HH in Behchokò), 5 (of 80 HH in Gamètì) and 6 in Norman Wells.

Table 1 - Communities and Households Surveyed

Community	Households Surveyed		Total Households (2021) <sup>2</sup>	% of Households in Community
	2020/21	2021/22		
Déljñę	-	45	190	23.7%
Fort Good Hope	18	-	195	9.2%
Fort McPherson	-	68	255	26.6%
Paulatuk	22	7	80	27.5% (20/21) 8.8% (21/22)
Sachs Harbour	26	13	35	74% (20/21) 37.1% (21/22)
Tsiigehtchic	13	23	60	21.6% (20/21) 38.3% (21/22)
Tulita	42	28	135	31.1% (20/21) 20.7% (21/22)
Tuktoyaktuk	-	16	285	5.6%
Ulukhaktok	18	40	130	13.8% (20/21) 30.8% (21/22)
Wekweètì	11	6	30	36.7% (20/21) 20% (21/22)
Whatì	41	13	145	28.3% (20/21) 9% (21/22)
<b>Total</b>	<b>191</b>	<b>259</b>		

<sup>2</sup> Total numbers of households (HH) taken from Statistics Canada's 2021 Census (<https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E>).

## ***Rural NWT Households Report High Prices as Primary Barrier to Internet Access***

Surveys consisted of 23 questions that focused on aspects of digital inclusion, including technical challenges related to Internet services experienced by households, details regarding access to and availability of Internet services, overall hopes and concerns regarding Internet, and self-assessed levels of digital literacy. In both rounds of surveys, we asked participants if they have Internet services at home.<sup>3</sup> Given the household unit of analysis used in this research, we focused on residential monthly Internet services. We separated responses to this question into 'yes', 'no', and 'not sure'.

We found that approximately half to one-third of household respondents reported they do not have home Internet services (see Tables 2 and 3 below). Responses reflect variation among communities: some reported relatively high numbers of home Internet (e.g. Paulatuk in 2020/21, Wekweèti in 2021/22) and others reported low numbers (e.g. Tuktoyaktuk and Whatì in 2021/22).

We also asked participants who do not have home Internet, why that is.<sup>4</sup> To our knowledge, this is the only research that has been conducted about this topic in these communities. We were interested in the key barriers to household Internet access reported by residents of rural NWT communities. To answer this question we sorted and analyzed data from the 'No' responses. Specifically, we coded responses into the following categories:

- “Price”
- “Use Mobile”
- “Another Reason”
- “No Interest”
- “Did Not Answer”

As presented in Tables 2 and 3, responses in both 2020/21 and 2021/22 found that **for surveyed households, more than half (51% in 2020/21; 55% in 2021/22) of respondents who gave a reason for not having Internet at home report that it is because of price.**<sup>5</sup> Depending on the year, in communities such as Tulia, Wekweèti, Déljñę, Paulatuk, Tulita and Ulukhaktok, *more than two-thirds* of respondents who gave a reason noted the high price of service is why they do not have home Internet. We also note that the second most common

---

<sup>3</sup> We used slightly different wording for this question in 2020/21 and 2021/22. The specific question wording was:  
2020/21: Do you have internet in your home? ( Yes, No, Not Sure )  
2021/22: Do you currently subscribe to internet service at home? ( Yes, No, Not Sure )

<sup>4</sup> We used slightly different wording for this question in 2020/21 and 2021/22. The specific question wording was:  
2020/21: If you do NOT have home internet why is that? (For example -- too expensive, not available, not interested, etc)”.  
2021/22: If you do NOT have Internet service at home, why is that? (For example -- too expensive, not available, not interested, etc)”.

<sup>5</sup> Of all survey respondents, 14% in 2020/21 and 7% in 2021/22 did not give any reason why they do not have household Internet. These 'No answer' responses are presented in Table 2 but are not included in our analysis of coded responses.

reason reported by respondents was because they use mobile services instead of household Internet services.

Table 2: Household Survey Responses from 2020/21

Communities	Do you have Internet?			Why not?		Coded responses (% of responses)	
	Yes	No	Total	No answer	Number of responses	Price	Use Mobile
Fort Good Hope	9	9 (50%)	18	1	8	4 (50%)	1 (13%)
Paulatuk	21	1 (5%)	22	1	0		
Sachs Harbour	19	7 (27%)	26	0	7	2 (29%)	4 (57%)
Tsiigehtchic	9	4 (31%)	13	4	0		
Tulita	25	17 (40%)	42	2	15	10 (67%)	0
Ulukhaktok	14	4 (22%)	18	0	4	2 (50%)	1 (25%)
Wekweèti	8	3 (27%)	11	0	3	2 (67%)	1 (33%)
Whati	22	19 (46%)	41	1	18	8 (44%)	1 (6%)
<b>Total (20/21)</b>	<b>127</b>	<b>64 (34%)</b>	<b>191</b>	<b>9 (14%)</b>	<b>55</b>	<b>28 (51%)</b>	<b>8 (15%)</b>

Table 3: Household Survey Responses from 2021/22

Communities	Do you have Internet?			Why not?		Coded responses (% of responses)	
	Yes	No	Total	No answer	Number of responses	Price	Use Mobile
Délı̄në	25	20 (44%)	45	0	20	18 (90%)	1 (5%)

Fort McPherson	42	26 (38%)	68	0	26	4 (15%)	12 (46%)
Paulatuk	2	5 (71%)	7	0	5	<b>4 (80%)</b>	0
Sachs Harbour	10	3 (23%)	13	0	3	1 (33%)	1 (33%)
Tsiigehtchic	12	11 (48%)	23	0	11	<b>6 (55%)</b>	1 (9%)
Tuktoyaktuk	6	10 (63%)	16	3	7	3 (43%)	4 (57%)
Tulita	15	13 (46%)	28	1	12	<b>8 (67%)</b>	0
Ulukhaktok	24	16 (40%)	40	2	14	<b>9 (64%)</b>	1 (7%)
Wekweèti	5	1 (17%)	6	0	1	0 (0%)	0
Whati	6	7 (54%)	13	2	5	<b>4 (80%)</b>	0
<b>Total (21/22)</b>	<b>147</b>	<b>112 (43%)</b>	<b>259</b>	<b>8 (7%)</b>	<b>104</b>	<b>57 (55%)</b>	20 (19%)

### ***Affordability Divides Exist in North/South Contexts and Between Rural/Remote NWT Communities***

We also wanted to learn what household Internet plans residents of rural NWT communities are subscribing to. We use the term “monthly base plan” because many plans include data coverage and other fees in addition to monthly costs; these are discussed below. In 2020/21, we asked respondents in six (6) communities to tell us which monthly base plan they currently subscribe to.<sup>6</sup> This was a closed-answer question that presented a list of the plans available in their community that was drawn from Northwestel’s website.<sup>7</sup> Since Northwestel’s residential plans are regulated and set by the CRTC, we can find details on available plans for each individual

<sup>6</sup> In 2020/21, we asked this question in these six communities, and asked a more open-ended question in the remaining 2 communities. In 2021/22 we only asked the open-ended question.

<sup>7</sup> The specific question that we asked was: “If you DO have Internet, which Home Internet Plan do you have?”. We then presented respondents with a list of the plans available in their community (drawn from Northwestel’s website in December 2020). We included the option ‘another plan not listed here’ so respondents could note if they are unsure or may have an alternative monthly service plan.



community on the company’s website. A summary of responses to this question is presented in Table 4 below.

Table 4: Subscribers to Monthly Base Household Internet Plans from 2020/21

Communities	Slower Plans Available in Community (advertised download speed, monthly usage)						Fastest Available Plan in Community (advertised download speed, monthly usage)				
	\$41.95 (768 Kbps, 10GB) satellite	\$57.76 (768 Kbps, 10GB)	\$64.95 (2.5 Mbps, 40GB) satellite	\$71.95 (2.5 Mbps, 80GB)	\$76.25 (5 Mbps, 200GB)	\$78.46 (2.5 Mbps, 80GB)	\$79.95 (5 Mbps, 60GB) satellite	\$82.97 (5 Mbps, 200GB)	\$96.95 (15 Mbps, 300GB)	\$103.97 (15 Mbps, 300 GB)	Number of Subscribers
Fort Good Hope	N/A	3	N/A	0	1	N/A	N/A	N/A	5*	N/A	9
Sachs Harbour	1	N/A	5	N/A	N/A	N/A	8*	N/A	N/A	N/A	14
Tulita	N/A	0	N/A	1	2	N/A	N/A	N/A	19*	N/A	22
Ulukhaktok	1	N/A	1	N/A	N/A	N/A	9*	N/A	N/A	N/A	11
Wekweëti	1	N/A	2	N/A	N/A	N/A	4*	N/A	N/A	N/A	7
Whati	N/A	1	N/A	N/A	N/A	0	N/A	7*	N/A	7*	15
<b>Total Subscribers</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>21</b>	<b>7</b>	<b>24</b>	<b>7</b>	<b>78</b>

\* In Whati the fastest available (non-satellite) broadband plan is \$103.97 (15 Mbps, 300 GB); therefore the 7 households paying \$82.97 (5 Mbps, 200GB) are classified as ‘slow’ plans in later in the report, in Table 7.

Although the number of respondents who provided this information is small, we believe they are representative of rural/remote NWT subscribers. These data enabled us to estimate the average and median plan prices that NWT residents in these communities reported paying for their household Internet services in 2020/21. **Our analysis determined that in 2020/21 the average monthly costs for monthly base household Internet plans ranged from \$70 - \$91.**

Interestingly, by this metric satellite-served communities pay less for a monthly base plan than terrestrial communities (\$73 versus \$91 average per month). Across all communities, the median monthly base plan cost (2020/21) was \$79.95.

To further examine geographic affordability divides, we then compared these average prices to the average prices paid for monthly base plans in urban/Southern Canada, as presented in the most recent CRTC Communications Market Report (2021)<sup>8</sup>. Table 5 illustrates the variation of average monthly base plan prices across surveyed NWT communities.

<sup>8</sup> <https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring/ban.htm>

Table 5: Analysis of Relative Prices of Monthly Base Household Internet Plans from 2020/21 (Rural/Remote NWT vs Urban South)

Communities	# Plans (2020/21 surveys)	Avg. monthly base plan price (NWT)	Median monthly plan price (NWT)	Avg. monthly base plan price (Urban South) 25/3 Mbps, 100GB/month*	% difference between Avg. monthly base plan: NWT vs Urban South
Fort Good Hope**	9	\$81.59	\$96.95	\$76.15	+7.14%
Sachs Harbour	14	\$71.88	\$79.95	\$76.15	-5.61%
Tulita**	22	\$93.93	\$96.95	\$76.15	<b>+23.35%</b>
Ulukhaktok	11	\$75.13	\$79.95	\$76.15	-1.34%
Wekweèti	7	\$70.24	\$79.95	\$76.15	-7.76%
Whatì	15	\$91.09	\$82.97	\$76.15	<b>+19.62%</b>
<b>All</b>	<b>78</b>	<b>\$83.22</b>	<b>\$82.97</b>	<b>\$76.15</b>	<b>+9.28%</b>

\*<https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring/ban.htm>

\*\* Note that these figures are DSL services from our analysis in 2020/21; as of Aug. 2022 Fibre services are available <https://www.nwtel.ca/northwestel-launches-fibre-internet-fort-good-hope-and-tulita> .

The comparison presented in Table 5 suggests two things. First, the average costs of different monthly base plan prices illustrate a clear affordability gap between rural/remote NWT communities and urban southern communities (which have higher speed and data): **an average price gap of 9.28%**.

Second, this analysis reflects price disparities between different rural/remote NWT communities. **This rural/remote NWT affordability gap is reflected most clearly between households in Tulita and Whatì (that respectively pay 23.35% and 19.62% more than urban Southern households), and those in Wekweèti and Sachs Harbour (that pay 7.76% and 5.61% less).** Curiously, the costs of household monthly base plans in remote, satellite-served communities appear to be **lower** than those in urban southern communities.

To account for this observation, we note that this analysis of average prices paid for monthly base plans does not include data overage fees (which may significantly increase costs in Northern households, particularly in satellite-served communities) or other communications services such as mobile phone subscriptions, telephone services, and/or cable/TV subscriptions. Furthermore, in some NWT communities connected to DSL Internet (e.g., Gamètì, Ulukhaktok), household subscribers must also purchase a telephone line (at a cost of



\$36.74/month)<sup>9</sup> along with their monthly base plan for Internet services. As we discuss in more detail below, many smaller-population, rural/remote NWT communities have a high proportion of low-income households.

### ***Compared to Urban Households in the NWT, Rural/Remote NWT Households Pay Higher Percentage of Income for Household Internet Services and Data Overage Fees***

While the monthly base plan for household services is an important aspect of affordability, it does not tell the whole story. We must also consider additional costs that households must pay, such as for data overage and telephone lines. We estimated data overage fees using Northwestel's Usage Estimator tool. During the COVID-19 pandemic, two-way videoconferencing became an important way for citizens to access essential services such as health care and education. Since two-way videoconferencing is not available as an option on Northwestel's Usage Estimator, we chose streaming video as the closest approximation. Conservatively, we estimated households use data equivalent to streaming one-hour of Standard Definition video per day on one device (93GB). We added the cost of home phone services to those communities that require it to access Internet services.

We use these amounts to calculate the lowest possible price households pay among the available Internet plans for each community. For example, in Ulukhaktok the lowest cost of a monthly service plan (including 93GB of data) including ancillary fees was calculated this way:

- 1) DSL Satellite 5 (60GB, \$79.95/month) monthly base plan;
- 2) Data overage fees (above monthly base plan limit) for 33GB, which equals \$99;
- 3) Home phone services (required by this plan), which costs \$36.74/month.

The estimated total cost to watch one hour of streaming video per day on one device in Ulukhaktok is:  $\$79.95 + \$99 + \$36.74 = \mathbf{\$215.69}$ . Using Statistics Canada data, this represents 3.34% of the median after-tax total monthly household income in that community. We note this price only considers Internet services: it does not include the monthly fees that are charged by 'over the top' service providers (e.g. Netflix, Amazon Prime, Disney+). It also only considers a single device – many NWT households have high numbers of residents and connected devices.

In comparison, using Statistics Canada data the monthly cost for the same level of service in a household in the Urban South is estimated at 0.3% of the median household income. This relative cost is also lower than that of median household incomes in urban centres in the NWT. For example, in Yellowknife, the cost of 93 GB of data is already included in an available monthly base plan (e.g. Internet 10: 200 GB, \$62.95/month). This represents 0.69% of the

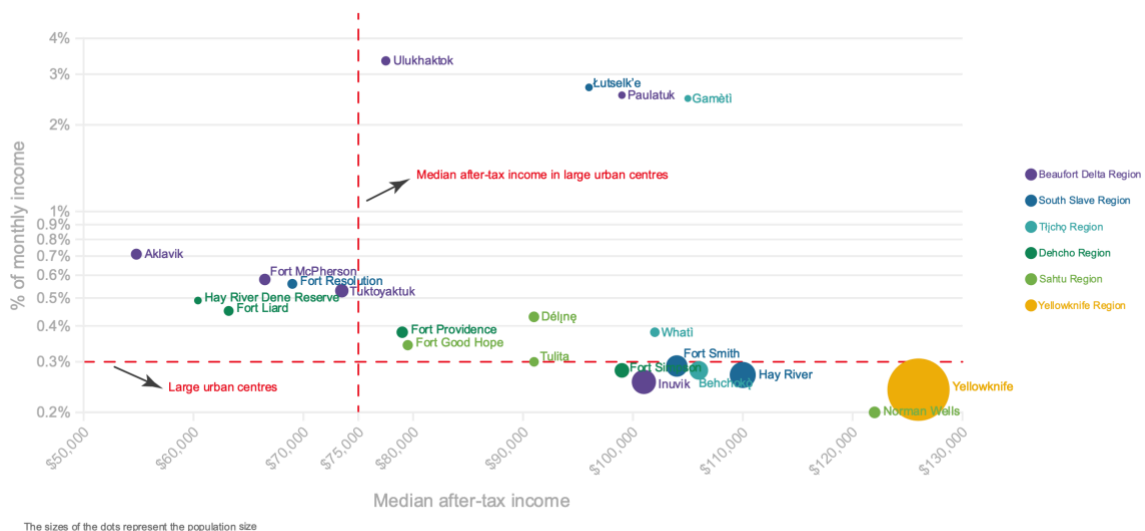
---

<sup>9</sup> On the Northwestel website, details on applicable Internet plans state: "Northwestel Phone service is required for Internet Packages" <https://www.nwtel.ca/internet-plans>. Home phone plans are listed as \$36.74/month : <https://nwtel.ca/home-phone-plans>. We note that in CRTC 2022-147, the Commission states: "Northwestel Inc. (Northwestel) charges a \$20 monthly surcharge, per Item 1735 of its General Tariff, to retail customers of its stand-alone residential Digital Subscriber Line (DSL) Internet services in certain high-cost serving areas" (Q10 of the Notice). However, for the purposes of our analysis we use the amount posted on Northwestel's website since that appears to be the amount that consumers are required to pay when ordering Internet services in these communities.

median household income in Yellowknife (\$9,083/month). We note that satellite-served, small population, geographically rural/remote communities like Ulukhaktok are the ones most dependent on telecommunications services to access public services like health care and education due to limited 'brick and mortar' options (O'Donnell & Beaton, 2018; McMahon & Akcayir, 2022b).

Figure 1 provides an illustration of these relative costs by median income. It is restricted to communities where information is provided in Statistics Canada's 2021 Census Report. When data coverage fees and telephone services are included, **a significant affordability divide exists within the NWT between more urban/larger population communities and smaller-population, more geographically remote communities**. Larger urban centres (which typically have higher median household incomes) also spend a lower proportion of their monthly income on monthly household Internet costs. Finally, the outlier communities paying the highest proportion of their monthly income on household Internet costs are the most geographically remote communities in the NWT.

Fig. 1: Distribution of Relative Costs (1-hour Movies or TV shows/day on 1 device) among NWT Communities



- Dot sizes represents population in 2021: <https://www.statsnwt.ca/population/population-estimates/bycommunity.php>
- Median after-tax income taken from: <https://www150.statcan.gc.ca/t1/tb1/en/tv.action?pid=9810005701>
- Household income data in Sachs Harbour, Tsiigehtchic, Jean Marie River, Kakisa, Nahanni Butte, Samba K'e, Wrigley, Colville Lake, Enterprise, Dettah, and Wekweeti were not available in the 2021 Census and so are not included here.
- Internet plan rates taken from: <https://www.nwtel.ca/internet-plans> (access date 2-3 Aug., 2022)
- Data usage estimator: <https://www.nwtel.ca/internet-plans> (access date Aug., 2022)
- Recommended internet download speeds for playing (standard definition) TV shows and movies on Netflix: <https://help.netflix.com/en/node/306>
- Median after-tax income in large urban centres taken from: <https://www150.statcan.gc.ca/n1/daily-quotidien/220713/dq220713d-eng.htm?lnk=dai-quo&indid=32988-1&indgeo=0>
- Avg. Price (Urban /South) taken from: <https://www150.statcan.gc.ca/t1/tb1/en/tv.action?pid=9810005701> <https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring/ban.htm>

### ***Inequalities Exist within Rural/Remote NWT Communities with High Proportions of Low-Income Households***

It is important to also consider income inequalities present within communities. Although the average and median household incomes in the NWT are quite high compared to the rest of Canada, a relatively high number of residents living in the territories are classified as low-income families (which Statistics Canada defines as an annual household income of \$42,197 or \$3,516.42/month). Table 6 presents the estimated total monthly costs for Internet services borne by households in rural/remote NWT communities, as a percentage of monthly income in low-income households.

We note that in several of these communities, such as Aklavik, Tuktoyaktuk, and Ulukhaktok, one-fifth (20%) or more of the population are classified as low-income families. **The cost of the lowest price monthly base plan and data overage fees in these low-income households ranges from 1.79% to 2.36% of overall monthly income. These costs more than double when we include estimated fees for telephone services. For low-income residents of Ulukhaktok, who make up almost one-quarter of the community or one in every four households, these costs reflect an estimated 6.13% of their total monthly income.** Details of the percentage of low-income households in several other communities (Coville Lake, Sachs Harbour, Samba K'e, and Wekweètì) that reflect similar costs are not available in the most current Statistics Canada reporting.

**Table 6: Estimated Monthly Cost of a 1-hour/day Streaming Video on 1 device for low-income households (\$42,197).**

Community	Population <sup>1</sup>	% of population classified as low-income families after-tax (\$42,197 / year) (\$3,516.42 / month)	Cheapest broadband plan that supports SD (low quality) streaming video <sup>2</sup>				Movies and TV Shows (1 hour a day on 1 device) 93 GB/month <sup>3</sup> , 1 Mbps <sup>4</sup>	% of monthly low-income household income (\$3,516.42/month)
			Price	Data	Download	Upload		
Aklavik	684	31.8%	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Behchokò	1952	13.0%	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Colville Lake	159	n/a	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Déjıne	627	15.8%	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Dettah	226	n/a	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Enterprise	116	n/a	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Fort Good Hope**	601	10.3%	\$76.95	160 GB	20 Mbps	3 Mbps	\$76.95	2.19%



Fort Liard	558	20.6%	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Fort McPherson	737	23.5%	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Fort Providence	753	9.8%	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Fort Resolution	548	15.2%	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Fort Simpson	1214	8.9%	\$76.95	160 GB	20 Mbps	3 Mbps	\$76.95	2.19%
Fort Smith	2579	8.0%	\$62.95	200 GB	10 Mbps	2 Mbps	\$62.95	1.79%
Gamèti	280	0%	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Hay River	3823	9.4%	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Hay River Dene Reserve	338	27.8%	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Inuvik	3303	11.8%	\$76.95	160 GB	20 Mbps	3 Mbps	\$76.95	2.19%
Jean Marie River	86	n/a	\$79.95	300 GB	20 Mbps	3 Mbps	\$79.95	2.27%
Kakisa	36	n/a	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Lutselk'e	335	0%	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Nahanni Butte	101	n/a	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Norman Wells	768	5.7%	\$62.95	200 GB	10 Mbps	2 Mbps	\$62.95	1.79%
Paulatuk	311	6.3%	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Sachs Harbour	109	n/a	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Sambaa K'e	98	n/a	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Tsiigehtchic	190	n/a	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Tuktoyaktuk	1023	28.1%	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Tulita**	513	11.1%	\$76.95	160 GB	20 Mbps	3 Mbps	\$76.95	2.19%
Ulukhaktok	489	22.2%	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Wekweèti	150	n/a	\$79.95*	60 GB	5 Mbps	1 Mbps	\$215.69*	<b>6.13%</b>
Whati	519	14.3%	\$82.97	200 GB	5 Mbps	512 Kbps	\$82.97	2.36%
Wrigley	122	n/a	\$76.95	160 GB	20 Mbps	3 Mbps	\$76.95	2.19%
Yellowknife	21775	5.2%	\$62.95	200 GB	10 Mbps	2 Mbps	\$62.95	1.79%

<sup>1</sup> <https://www.statsnwt.ca/population/population-estimates/bycommunity.php>

<sup>2</sup> Internet plans, <https://www.nwtel.ca/internet-plans> (access date 2-3 Aug., 2022)

<sup>3</sup> Usage estimator, <https://www.nwtel.ca/internet-plans> (access date Aug., 2022)



<sup>4</sup> Recommended internet download speeds for playing (standard definition) TV shows and movies on Netflix, <https://help.netflix.com/en/node/306>

\* Northwestel Phone service is required for Internet Packages (\$36.74 / month) and therefore is added in total cost.

\*\* As of Aug 2022, these communities have new Fibre Internet plans. In this analysis we chose the lowest-cost plan: Fibre 20 (160 GB of data for \$76.95/month).

n/a: Indicates that data were suppressed by Statistics Canada to meet the confidentiality requirements of the Statistics Act

We note that as of August 2022, some of these communities can access newly deployed fibre optic Internet infrastructure. The Fibre Internet plans offered by Northwestel include high data allowances, but also reflect higher costs for monthly base plans (e.g. 450GB/month for \$110.95). While the new Fibre Internet plans may avoid excessive data overage charges, for low-income households, these new plans still represent a relatively high percentage — **3.16%** — of the monthly income of low-income.<sup>10</sup>

We note that our analysis of 1 hour of streaming video per day is a conservative estimate of daily Internet usage. We do not have access to primary data from these communities regarding monthly data usage (and corresponding overage fees). Given increasing use of videoconferencing and other high-bandwidth applications, we expect that Northern households — which typically have high numbers of residents and devices — are consuming much more data than the equivalent of one (1) hour of Standard Definition streaming video per day. Using open-ended questions, we did ask about data overage costs in our household surveys and respondents noted that they paid hundreds, and in a few cases thousands, of dollars in monthly overage fees. These data require more validation to confirm and so we do not report them here.

### ***When Rural NWT Households Can Afford Internet, Most Opt for Faster Plans***

Finally, we examined the number of survey respondents who indicated that they subscribe to higher-end monthly Internet plans. We did this to explore how many households in these communities choose to subscribe to faster Internet - despite the higher costs involved.

To do this, we organized the 13 available Northwestel Monthly Base Household Internet Plans from our 2020/21 surveys into two categories: “Slowest available Plans” (N=26; \$41.95 to \$57.76) and “Fastest available Plans” (N=52; \$79.95 to \$103.97). We determined these two categories based on the Advertised plans on Northwestel’s website - “Fastest available Plans” are those with the fastest speed Internet in each community.

Table 7 illustrates the numbers and percentages of survey respondents from 2020/21 who reported they subscribed to the fastest plans available in the six communities included in this analysis. While the number of overall respondents to this question is low, we can see that **in all communities except Whatì, regardless of connection technology (satellite and non-**

---

<sup>10</sup> We recognize that inequalities and high numbers of low income households also exist inside more urban centres in the NWT and elsewhere.

satellite), the majority of respondents indicated they are subscribing to the Fastest Plan available.<sup>11</sup> Note that the prices shown do not include overage charges.

Table 7: Relative Speed and Price of Monthly Base Household Internet Plans from 2020/21

Communities	Total Number of subscribers	Avg. Price	Number of respondents who subscribe to the fastest available plan	% of respondents who subscribe to the fastest plan
Fort Good Hope	9	\$81.59	5	56%
Sachs Harbour	14	\$71.88	8	57%
Tulita	22	\$93.93	19	86%
Ulukhaktok	11	\$75.13	9	82%
Wekweèti	7	\$70.24	4	57%
Whati	21	\$91.09	7	33%
<b>All</b>	<b>78</b>	<b>\$83.22</b>	<b>52</b>	<b>67%</b>
Satellite	32	\$72.64	21	66%
Non-Satellite	46	\$90.59	31	67%

This analysis reveals that **for those households that can afford it, when given the choice, they will tend to choose the fastest (and most expensive) plan available in their community.** This supports the argument that demand for Internet services is high, and that affordability — rather than lack of interest — is a primary reason why households in rural/remote NWT communities may not subscribe to Internet Services.

## Conclusion

In conclusion, our research found that many households in rural/remote NWT communities desire faster Internet with higher data caps – and when they can afford it, pay for that level of service. We also found that high numbers of households who are not subscribing to household Internet services report it is because of affordability challenges and high prices. This problem is compounded for the high proportion of low-income households in rural/remote communities, who must not only pay higher prices for Internet due to ancillary costs such as data caps and telephone lines, but also rely more on telecommunications services to access essential public services and participate in economic activities due to limited in-person resources available locally. This highlights the importance of considering cost factors such as data caps and telephone lines, as well as differing levels of household income, when assessing affordability.

<sup>11</sup> Whati is an outlier case because it had plans available at \$82.97 (5 Mbps, 200GB) (classified as one of the fastest plans for other communities) and \$103.97 (15 Mbps, 300 GB). As of August 2022, Fibre Internet plans are available in Whati





## Appendix A: Study Methodologies

In this article we presented the results of recent household surveys about issues such as Internet access, availability, affordability and reliability from small rural communities in the Northwest Territories (NWT), which we define as the 29 communities outside of Yellowknife, Inuvik, Fort Smith, and Hay River. Some of these are fly-in communities that lack year-round road access. To our knowledge there is very limited primary digital inclusion data available from these rural NWT communities. We analyze this survey data using secondary data drawn from Statistics Canada, the CRTC, and Northwestel.

We conducted two phases of surveys: 2020/21 and 2021/22. Due to COVID-19 restrictions, our team worked remotely to train, hire and support researchers located in the communities. Using a combination of hard-copy survey kits and tablets, email, telephone and Zoom (where available), we trained local researchers in a variety of topics, including survey methods and ethical and privacy requirements. The local researchers went door-to-door with tablets and asked residents a series of questions about digital inclusion. Responses were collected on tablets via a customized version of the Open Data Kit app, and transferred to University of Alberta researchers for analysis.

Limitations of this research include an overall small sample size ( $N = 476$ ) which makes it difficult to generalize from our findings. We also note the difficulties involved in remote data collecting (e.g., recruiting and retaining local researchers – a lengthy and complicated process that requires numerous telephone calls between the main researcher and the local surveyors). We also experienced unexpected challenges and delays posed by the COVID-19 pandemic. It also should be noted that we accumulated a larger data archive than is reported here, due to a mid-study update in the survey questions. In this article we include only the participants' responses to questions about specific, available Internet plans. Our team recognizes these limitations and is continually improving our data collection processes to increase the reliability, validity, and representability of data.

The survey research was funded through the Digital Literacy Exchange Program administered by Innovation, Science and Economic Development Canada (ISED). The research was used to develop and implement digital literacy courses in communities across the NWT. Surveys were developed with and supported by DigitalNWT partner organizations including: Tłıchq Government, Sahtú Renewable Resources Board, Gwich'in Tribal Council and Inuvialuit Regional Corporation (IRC). The research operated under annual NWT Research Licenses (#16552, #16693, #16786 and #16990) and was approved by the ethics boards of the University of Alberta, Aurora College, Tłıchq Government, and Aurora Research Institute. The survey methodology was also approved by Public Health NWT and the University of Alberta Field Research Office.

Local researchers followed a health protocol which included: conducting a COVID-19 self-assessment on themselves and with the survey participants; following social distancing



guidelines and wearing a mask; and washing their hands and wiping down tablets after conducting surveys and when delivering these surveys. To protect the privacy of survey respondents, local researchers signed confidentiality forms. The primary data presented in this report are self-reported and voluntary, and the collection methods follow the standards of ethical research. The respondents were not required to answer every question. We present primary data only from those participants who provided consent and are over 18 years of age.

## References

- Council of Canadian Academies. (2021). *Waiting to connect: The expert panel on high-throughput networks for rural and remote communities in Canada*. Retrieved from <https://cca-reports.ca/reports/high-throughput-networks-for-rural-and-remote-communities/>
- CRTC. (2016). *Telecom Regulatory Policy CRTC 2016-496*. Retrieved from <https://crtc.gc.ca/eng/archive/2016/2016-496.htm>
- CRTC. (2021). *Broadband Fund*. Retrieved from <https://crtc.gc.ca/eng/internet/fnds.htm>
- CRTC. (2022a). *Current trends - High-speed broadband*. Retrieved from <https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring/ban.htm>
- CRTC. (2022b). *What you should know about Internet speeds*. Retrieved from <https://crtc.gc.ca/eng/internet/performance.htm>
- Hambly, H., & Rajabiun, R. (2021). Rural broadband: Gaps, maps and challenges. *Telematics and Informatics*, 60, 101565. doi:<https://doi.org/10.1016/j.tele.2021.101565>
- Hudson, H. E. (2011). Digital diversity: broadband and indigenous populations in Alaska. *Journal of Information Policy*, 1, 378–393.
- Hudson, H. E. (2017). When regulation fills a policy gap: Toward universal broadband in the remote north. Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2944295](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2944295).
- ISED. (2021). *Universal broadband fund*. Retrieved from [https://www.ic.gc.ca/eic/site/139.nsf/eng/h\\_00006.html](https://www.ic.gc.ca/eic/site/139.nsf/eng/h_00006.html)
- McMahon, R., & Akçayır, M. (2022a). Investigating concentrated exclusion in telecommunications development: Engaging rural voices from Northern Canada. *Journal of Rural Studies*, 95, 183–194. doi:10.1016/j.jrurstud.2022.09.004
- McMahon, R., & Akçayır, M. (2022b). Voices from Northern Canada: Integrating stakeholder expectations in telecommunications policy for rural, remote and Northern regions. *Telecommunications Policy*, 46(9), 102402. doi:10.1016/j.telpol.2022.102402
- McMahon, R., Akçayır, M., McNally, M. B., & Okheena, S. (2021). Making Sense of Digital Inequalities in Remote Contexts: Conceptions of and Responses to Connectivity Challenges in the Northwest Territories, Canada. *International Journal of Communication*, 15, 5229–5251.
- O'Donnell, S., & Beaton, B. (2018). A “whole-community” approach for sustainable digital infrastructure in remote and Northern First Nations. *Northern Public Affairs*, 6(2), 34–37.
- OECD. (2021). *Bridging digital divides in G20 countries*. Retrieved from <https://www.oecd-ilibrary.org/content/publication/35c1d850-en>.
- Weeden, A., & Kelly, W. (2021). Canada's (Dis)connected rural broadband policies: Dealing with the digital divide and building 'digital capitals' to address the impacts of COVID-19 in rural Canada. *Journal of Rural and Community Development*, 16(4), 208–224.